

## Cartographical Representation of the Scandinavian Arctic Regions

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Today the term "Scandinavia" describes the geographical area comprising Denmark, Norway, and Sweden. Various small states had grouped together to form these three kingdoms by about the year 820. Their mutual frontiers were drawn up two centuries later and finally established at Kungahälla in 1101 by the three kings concerned. Later Sweden undertook the conquest of Finland which she subjugated completely during the thirteenth century. In 1323 the frontier between Sweden and Russia was fixed across the Finnish peninsula. In the meantime Denmark had established an empire on the shores of the Baltic, from which she dominated this sea. In 1361 the Danes took over the strategically placed island of Gotland, until then a practically independent peasant state.

In the fourteenth century the Hanseatic League flourished and the Teutonic Knights reached the peak of their power. This German hegemony grew to such an extent that it became a menace to Denmark and Sweden. The three Nordic kingdoms, fearing a conflict which would leave the Germans master of the peninsula, therefore decided in 1389 to unite under one single Crown at the Union of Kalmar, after which Norway remained united with Denmark until 1814.

Sweden extended her habitations more and more to the north and east, and encroached further and further into the most distant regions of what were at the time Lapland and Finland until they fell under her control. The link between Sweden and Finland remained from then until 1809.

Thus during the period outlined here, from the fifteenth to the eighteenth centuries, the four Nordic countries formed — at least in principle — a single kingdom from 1389 to 1523, which later divided into two groups, the one Danish-Norwegian and the other Swedish-Finnish.

The contours of the Scandinavian peninsula began to appear on maps of southern Europe in the fourteenth century, but it was only in the following century that cartography, properly speaking, took shape. According to tradition, the head of the Union, Erik of Pomerania, who was in Venice in 1424, charged Claudius Clavus (b. 1388) to draw a geographical map of "tota Dania" (Storm, 1889:129-146, 1891:13-37; Björnbo and Petersen, 1909); that is to say, of all the Nordic countries. No further mention will be made here of the work of Clavus, dating from 1427 onwards, which became incorporated in Ptolemy's different editions. Erik's successors, Christopher of Bavaria, Christian I, and particularly Hans and Christian II, were actively associated with projects for arctic expeditions, without, however, achieving much success in the realization of their ambitions.

They were spurred on to mount these expeditions for several reasons, among which was the spell cast by Sir John Mandeville's 1357 account of a voyage. These stories, first written in French, were quickly translated into Latin. The Danish translation of the Latin text appeared about 1444 and its author took the liberty of radically modifying parts of the story. For example, he introduced a long passage about Ogier the Dane (Holger Danske), one of Charlemagne's great paladins, who had conquered India and converted the inhabitants to Christianity. His mission accomplished and on the point of returning to France, he named as his successor the son of a King of Friesland, Presbyter John, so nicknamed because he was always going to church. In the story, this John was associated with the legendary king Prester John, whom a great number of travellers had tried to find in medieval times. Notable among the seekers was Henry the Navigator, who tried to find him in the 1440s.

In the middle of the 1440s, a Danish nobleman called Vallarte arrived at the Portuguese court bearing letters of credence from Christopher of Bavaria, the King of the Union, to the effect that Vallarte was entrusted with the mission of finding Presbyter John and of exploring India, founded by Ogier the Dane, the hero of legend. Vallarte joined an expedition in 1448 but was imprisoned in Guinea. Ten years later a new Danish emissary called Laaland arrived in Portugal for the same purpose but he had no better luck and was dragged into the war against the Moors. These events were the origin of the longstanding contacts between Denmark and Portugal.

Christian I and Alphonse V were the next kings eager to send an expedition to the northern regions. About 1473-76 Christian I sent a group under the German corsair commanders Dietrich Pining and Hans Pothorst, with the Norwegian-Dane Jean Scolvus as pilot, to discover a northwest passage to India. (Scolvus is also mentioned in the account of the navigators who discovered the Anian-Bering strait.) It was Alphonse V who took this initiative, as he wanted to make the most of the Danes' knowledge of the northern maritime routes. A nobleman, Joao Vaz Cortereal, accompanied them as royal observer (Larsen, 1919, 1925). Later historians are not certain how far the expedition went but consider that it probably reached Labrador.

This venture would have sunk into oblivion if the accounts of the voyage of Columbus had not revived Danish ambitions to find unknown islands in the Atlantic, thus inspiring Christian II to send explorers to the arctic regions in 1514-15 (Svensson, 1960).

On 10 December 1520, Christian II ordered his admiral

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Sören Norby to prepare ships for an expedition to Greenland and, among other things, to look for islands on the other side of the Arctic Sea. When he addressed these orders to his admiral the King alluded to the instructions previously given to Dietrich Pining by Christian I.<sup>1</sup> Norby replied that he was prepared to leave for Greenland and to set sail "in whatever direction as pleased His Royal Highness" as soon as his ships were ready to weigh anchor. Christian was particularly worried that the Spanish conquerors ("hispanoles") were anxious to obtain a foothold in the northern regions, and took it upon himself to watch over Scandinavian interests in the North Atlantic. If possible, Norby was to establish a base to serve as a springboard for further exploration.

The King wanted to know whether "Danish immigrants" had established themselves in unknown lands, amongst whom he counted not only the Emperor Aurelius, who was said to have been born at Ribe and to have reached Palmyra during the course of his military campaigns, but also Ogier the Dane and Prester John who, according to Mandeville, had Danish ancestors.

However, Christian II had given up his arctic projects because he had other immediate worries: Gustavus Vasa had unleashed a revolt in Sweden. With the latter's election to the throne in 1523 the Union was finally broken up. Later, Gustavus Vasa indulged in plans similar to those of Christian II, with the difference that his expedition was destined for the northeast. A French theologian and diplomat called Hubert Languet, who was in Sweden in 1555 and 1557, told the Prince Elector Augustus of Saxony in a letter that the King had asked him to equip two ships for such an expedition. Languet had told the King that "he preferred journeys in inhabited countries to those in unknown and wild regions" (Langueti, 1699:I:171).

Apart from these royal dreams, however, there were expeditions which helped to draw much more precise geographical maps than those which were being contributed up until 1530 to Ptolemy's *Geographia*. One advantage of Christian II's links with Portugal was that the Portuguese maritime charts gave good details of the Scandinavian coastline. On one of these charts of Western Europe, made about 1523 and attributed to Pero Fernandes, the outline of the peninsula is reasonably accurately marked from Tromsö to Stockholm, which, however, is incorrectly marked with a Russian flag (Winter, 1939: 188-189).<sup>2</sup> This Portolano map was in the Sächsische Landesbibliothek in Dresden but was destroyed in the Second World War.

It is scarcely conceivable that the German geographer Jacob Ziegler (1471-1549) and the Swede Olaus Magnus (1490-1557) were unaware of the existence of the Portolano charts when they brought out, in 1532 and 1539 respectively, the first printed maps which put Scandinavia in its correct position. As soon as these maps were published, they gave a tremendous boost to the science of cartography. Ziegler's map was printed at Strasbourg appended to the book *Quae intus continentur*, and the "Carta marina" was printed in Venice in the form of a wall map of nine woodcut sheets.

Ziegler had obtained most of his information from Olaus

Magnus's brother John, the last Swedish archbishop. Although Olaus had been appointed John's successor he never occupied the post, as he had to go into exile when Gustavus Vasa introduced Protestantism into Sweden. He lived in exile at Danzig (Gdansk) from 1526 to 1537 and employed his time there gathering information on the navigable channels of the Baltic and questioning the seafarers. In choosing the title for his map, he intended to draw attention to the fact that the most precise information related to the coasts and anchorages, as well as the navigable channels of the interior. Olaus Magnus was born at Linköping but was educated in Germany. In May 1518 the Pope sent him to northern Sweden to sell indulgences with the aim of stopping the progress of the Reformation. After leaving Uppsala, he travelled along the coastal region to Hälsingland, where he turned off his route to go to Jämtland, a province administered by Norway but under the administrative jurisdiction of the Archbishop of Uppsala. He spent the winter at Trondheim, where he met the most important man in Norway after the King, Archbishop Erik Valkendorf, who gave him further information. In Rome Ziegler also profited from the Archbishop's detailed knowledge of Greenland, for Valkendorf had pushed his exploration to the northernmost reaches of his diocese and his information was useful, not only to Olaus Magnus, but afterwards to Barents the Dutchman and to Hudson the Englishman, because copies of his notes were distributed far and wide.

After his stay in Trondheim, Olaus resumed his northward journey and in the summer of 1519, he followed the coast from Medelpad to Övertorneå and reached the village of Pello, nearly 67° N (according to him it was 86°N) before retracing his steps that autumn. Even if his religious mission was unsuccessful, his voyage was of immense value to geographical research and contributed knowledge to the history of local civilizations.

The "Carta marina" recalls medieval cartography because Olaus decorated the districts where he did not know the topography with figurative scenes. Nevertheless, the map indicated correctly both the north/south orientation of Scandinavia (which until then had more often been shown in an east/west sense), and the position of the Kioelen range as the dividing line between the rivers flowing into the Atlantic and those flowing towards the Gulf of Bothnia. In 1572 this map was reproduced in a small format by the Roman map editor and engraver Antonio Lafreri, which helped to widen its distribution. It was also used in 1555 to illustrate the first edition of Olaus Magnus's historical work on the nordic regions, which was followed by numerous other editions. Towards the end of the sixteenth century, foreign cartographers such as Gerald Mercator corrected the lines of latitude which Olaus Magnus had put too far north, but in other respects this map served as a model for all maps of Scandinavia until 1626 (Richter, 1967; Ahlqvist, 1875:237-240, 248-249, 261-264, 269-271).

During the reign of Gustavus Vasa, the frontiers of Sweden reached right up to the Arctic Ocean. The Norwegians and the Russians, however, were keen to drive the Swedes away from the coast. The Lapps of Vestersjö who lived in these parts were actively protected by Gustavus Vasa, while the Nor-

wegian administrators tried to prevent them from fishing in the western seas. Frontier conflicts with the Russians took on a more menacing tone and the dispute over the Enare marshes, begun by the Swedes, was one of the origins of the frontier war between 1554 and 1557.

From the time that Gustavus Vasa had founded the town of Helsingfors (Helsinki) on the Gulf of Finland, he hoped that his countrymen would benefit from the prolific Russian trade. For this reason, the news that the Englishman Richard Chancellor had made a voyage from the Arctic Sea to Moscow was not likely to have pleased him. This discovery of a new route for Russian trade thwarted his ambition, which was the principle reason for his wanting to send an expedition to the Arctic under Hubert Languet. However, the death of the King put an end to this project.

Hostilities on the Russian frontier intensified after 1589. At the peace of Teusina in 1595, Sweden and Russia agreed that the frontier on the Arctic Ocean should be indicated by an old landmark 30 km east of Varanga, but opposition to this by Norway and Denmark led to the war of 1611-1613. At the peace meeting at Knäred in 1613, Sweden was obliged thereafter to give up all her rights over Finnmark.

Towards the middle of the sixteenth century, what one might call an embryonic school of cartography was formed in Denmark. Since 1550, Marcus Jordan (1521-1595) had been teaching mathematics and geography at the University of Copenhagen. His reputation as a cartographer had spread beyond the frontiers of his country and his work was highly praised by such map publishers as Abraham Ortelius and Gerard Mercator.

Even more celebrated was his compatriot Tycho Brahe (1546-1601), even though he had published only one small map of the island of Ven. In the 1580s Brahe had the intention of mapping the whole of Denmark. With this end in view, assisted by his pupils, he fixed the degree of latitude of many locations. But the bad relationship between King Frederic II and Brahe ruined the undertaking.

It was mostly his qualities as a teacher that made Brahe well known. Among his pupils was the Dutchman Willem Jansz Blaeu. It was thus through the mediation of Jordan and Brahe that good relations were established between the Danes and the most distinguished Dutch cartographers of the period. The Danes sought to turn this to their advantage in their frontier disputes over Finnmark on the Arctic Ocean coasts.

In view of the peace negotiations in the 1590s and early 1600s, the Swedish-Finnish state tried to make maps of this highly sensitive region in the extreme north (Grotenfelt, 1892; *Sverges traktater*),<sup>3</sup> but these attempts were judged too elementary to serve as a basis for political agreement. When, during a discussion on frontiers in February 1601, the Swedes produced a map drawn — but not to scale — by the Lapp officials Arent Josting and Ambjörn Jacobi, the opposing party refused to accept it. The Danes had the same experience in negotiating with the Russians the following year. The Russians felt the map submitted to them was imprecise: in their view Lapland could not have so many sizable rivers. The map in question was probably one that the Danes had ordered from

the Dutchman Simon van Salingen, now in the National Archives of Sweden.

These primitive examples of cartography are not as valuable as the geographical notes and written accounts of their journeys by travellers, of which a fairly large number has been preserved. The growing interest of the central authorities in the northern areas gave rise in the sixteenth century to a written summary of the oral traditions of the Lapp merchants (known as *Birkarlar*), handed down over the centuries. On Swedish royal and ecclesiastical instigation, several expeditions were organized in the Norrland, of which the most important, from the scientific point of view, were those of 1600-01 and 1601-02, when attempts were made to measure the position of the Pole. These exploratory forays, given the period in which they were undertaken, had nothing in common with the pleasure trips of today. For example, King Charles IX directed a minister from Stockholm to join the expedition of Arent Josting and Ambjörn Jacobi, which was going to examine the Lapp frontiers, as a penance "for the evil he had done" (Enewald, 1920:148; Johnsen, 1923:115, 136-137; Lönborg, 1903:9; *Danmark-Norges Traktater*, 1916:199-215).

Men learned in mathematics and astronomy, such as Johannes Bureus, took part in the 1600-01 exploration, and Daniel Theodori Hjort took part in that of 1601-02. Both men were closely connected with Andreas Bureus, who, in 1611, had engraved a map of "Lapponia" of which two variations exist, that in the library of the University of Uppsala and that — dated — in the Royal Library at Stockholm (Fig. 1). Andreas Bureus was the younger cousin of Johannes, to whom he owed his cartographical knowledge. Johannes, educated at Heidelberg, had introduced his cousin to polar and depth measurements and taught him how to draw and engrave maps. He had also made some astronomical instruments for him. Daniel Hjort was an official in the Royal Chancellery in Stockholm, as was Andreas Bureus. Even though the latter was a native of the south of Norrland, he appears never to have been as far north as Lapland. His map was based principally on the observations of others, including those of his cousin Johannes and of Daniel Hjort (Lönborg, 1901). Unfortunately, there is little information on the origins of the Lapponia map. We only know of a sole work as preparation, that of Titis of Varanger, whose map of the coast of Finnmark — now preserved in the National Archives at The Hague — was sent by Charles IX to the Dutch States General in December 1610 (Wiese, 1903). The shore regions and the archipelago are no better portrayed than on the map of Lapponia, and later Bureus made several improvements.

In 1603, the King ordered Andreas Bureus to make a general map of all the northern regions. The only preparatory aids he had available were two maps, one a map of Lapponia and the other a small map of Lake Mälär engraved about 1613, of which there is only one known copy, now in the Royal Library at Stockholm. This map of the north, engraved by Valentin Trautman, together with a descriptive text, was published in Stockholm in 1626. The map of Lapponia was reproduced without any important modifications except for a few corrections drawn on the North Atlantic coast. Allowing himself a

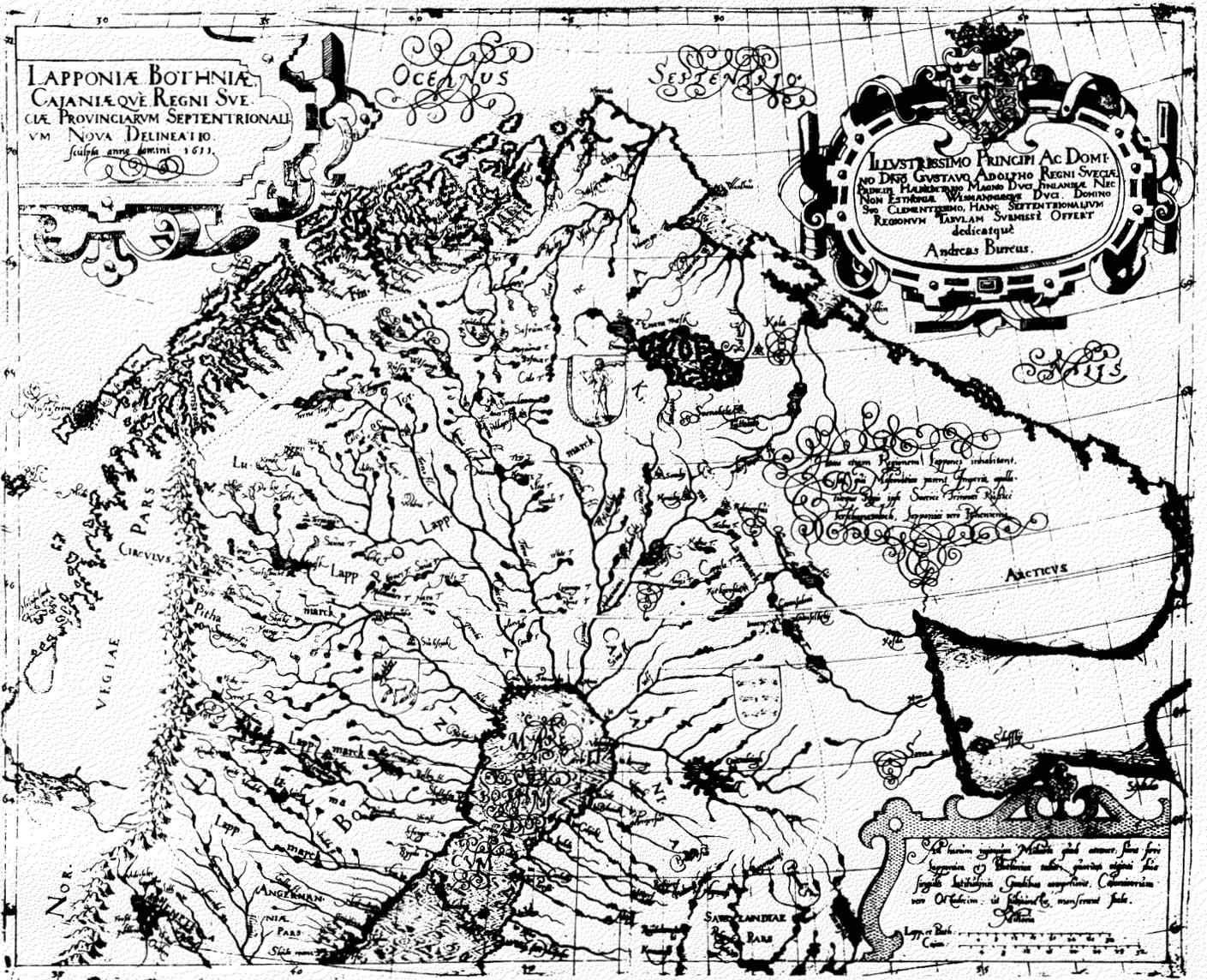


FIG. 1. Engraved copy of Andreas Bureus's 1611 "Lapponia" (Royal Library, Stockholm).

certain artistic license, Bureus placed scenes of local colour in appropriate areas of Lappland, such as a shaman beating a drum, reindeer, Lapp sleighs, and skiers. This map of the North was soon copied by foreign cartographic publishing houses, both in its large wall-map form of six sheets and also in its reduced form which could be put into an atlas (Richter, 1936).

The least satisfactory aspect of Bureus's portrayal of the Lapp reaches was that he placed the line of fjälls (mountains) from Titisfjord (Tysfjord) on the borders of Norway, directly south, instead of orienting it southwest. From evidence provided by the Lapps and the Birkarlar (peasants with the exclusive right to trade with the Lapps), the geographical siting of this range was relatively well known, but since the region south of Titis did not arouse such passionate and burning issues for political dispute as the Finnish frontiers, their testimony had never been systematically tested by the claims of an opposition party.

Following the victory of Christian IV, King of Denmark and Norway in 1613, the Swedes became less and less interested in the Lapp regions. Although both parties concerned were aware of the fact that there was no clear demarcation line between the two countries, the discovery of the Nasa silver mine in 1635 near the Norwegian border encouraged the Swedes to set their mapmakers to work again immediately.

In 1628, Andreas Bureus, then Head of the Swedish Survey Department,<sup>4</sup> promoted Olof Tresk, a native of Hälsingland, to the position of geometer and surveyor and gave him the task of mapping (as quickly as possible) Nasa and its surroundings, together with the region bordered in the north by the chain of mountains (Fig. 2). It was of immediate importance to delimit the Swedish-Norwegian frontier, and particularly that area rather cursorily mapped by Bureus.

From 1635-1643 Tresk frequently roved through the north of Sweden and Finland; by autumn of 1635 he was ready to make a map of Nasa Mountain.<sup>5</sup> He then continued to mark

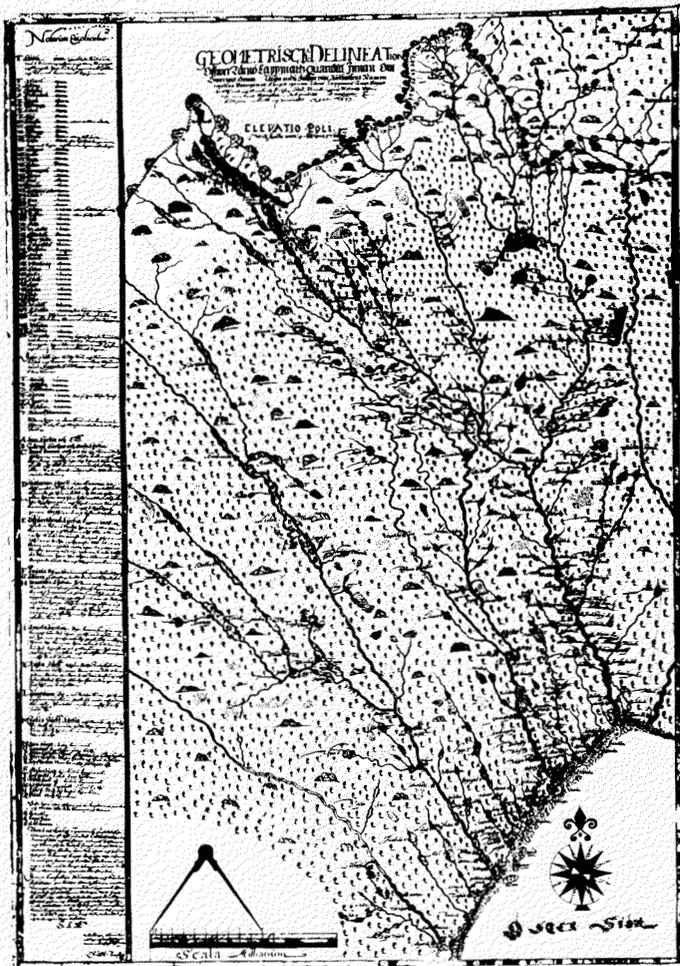


FIG. 2. Hand-drawn original of Olof Tresk's 1642 "Torne Lappmark" (Military Archives, Stockholm).

out the frontier along the mountain ridge which was accepted for the first time as the demarcation line between the two kingdoms. The Danish-Norwegian administration had considered this ridge as their frontier for a long time, but the Swedes firmly maintained that the Lapps, who wandered freely both across the mountains in the direction of Vesterhavet (West Fjord) and across the marshes of Enare to Varangerfjord, paid their taxes to the King of Sweden — hence the territory was clearly Swedish! In 1642-43 Tresk put forward to the Council of War two fair copies of maps of the Lapp frontiers of Kemi and Torne.<sup>6</sup> These maps were partly drawn by Tresk himself, but it is safer to consider the whole as a joint effort based on his rough drafts. As with Bureus, the greatest attention was paid to the river basins and the habitations bordering them. The fjälls (Kioelen mountains) are only sketchily drawn in. Tresk's map work had the result of improving communications, which in turn led to increased construction of churches in the Lapp frontier regions. After his death in 1645, the mapping of southern Lappland was continued by Jonas Giädda, who put the finishing touches to his map in 1671 (Qvigstad and Wiklund, 1909).<sup>7</sup>

The maps drawn up by Tresk and Giädda could have improved contemporary understanding of the Lapp regions, but

their secrets were jealously guarded by the military and land registry authorities. Tresk's work was nevertheless put to indirect use by Johannes Schefferus (1680), who used Tresk's notes to write his book entitled *Laponia*, while keeping to the details of Bureus's map. This book was first published in Latin in Frankfurt-am-Main and then rapidly translated into English, German, French, and Dutch. Schefferus, an eminent German professor at the University of Uppsala from 1648 until his death in 1679, never actually went to Lappland himself; he was, however, a passionate collector of any material — including written and oral accounts and local objects — that he could lay his hands on. For instance, a pastor called Samuel Rheen had published in 1671 a description of the section of Lappland crossed by the river Lule (Wiklund, 1897).<sup>8</sup> Schefferus had Rheen's illustrations engraved, together with some woodcuts inspired mainly by the work of D.K. Ehrenstrahl, which were to influence the European concept of life in Lappland for more than a century.

Parallel to this Swedish-Finnish overland cartographic activity in the seventeenth century, Danish-Norwegian marine expeditions produced a number of maps of the arctic regions, particularly in the northwest. One example is the "Stockholm chart" (Fig. 3), which was inserted into a collected account of journeys along the west coasts of Norway to Iceland, Greenland, and Newfoundland (Gosch, 1897).<sup>9</sup> The "Stockholm chart" is thought to be a copy, made in Copenhagen by Captain James Hill, of an original dating from 1605-07, which was later put to use by the Dutch cartographer Hessel Gerritsz. It exemplifies a feature characteristic of the time, in that the Scandinavians rarely published their new maps themselves, with the notable exception of the polar explorer Jens Munk, who in 1609-10 discovered a passage through the Arctic Ocean to Arkhangel'sk. In 1619-20 he followed in the wake of Henry Hudson to search for a Northwest Passage, during which voyage he discovered the Churchill River and probably Chesterfield and Rankin inlets. He published an engraved map of this region with his account of his voyage *Navigatio septentrionalis* (1624).<sup>10</sup> But the majority of the maps made by the Scandinavians disappeared into the archives. Thus a detailed map of Nordfjord in Norway, dating from 1594, remained hidden in the papers of Tycho Brahe for 400 years. Today this map is in the Austrian National Library in Vienna (Nissen, 1952:12). This is why the maps themselves did not lead to any improvement in the cartography of the northern regions of Scandinavia (Fig. 4).

However, one cannot escape the feeling that foreign cartographers sometimes refused to make the most of the materials available. For example, in 1688 the head of the Swedish Survey Office, Carl Gripenhielm, had made a general map of Sweden-Finland and the Baltic provinces, which was considered a great improvement on the work of Bureus, but which was not allowed to be published in Sweden. In 1704 it was found that this and several other maps had disappeared from the map archives. They were found later, having in the meantime been copied by the French cartographer Guillaume Delisle who in 1706 published a "Carte des Courones du Nord" in two sheets dedicated to Charles XII, King of Sweden. De-

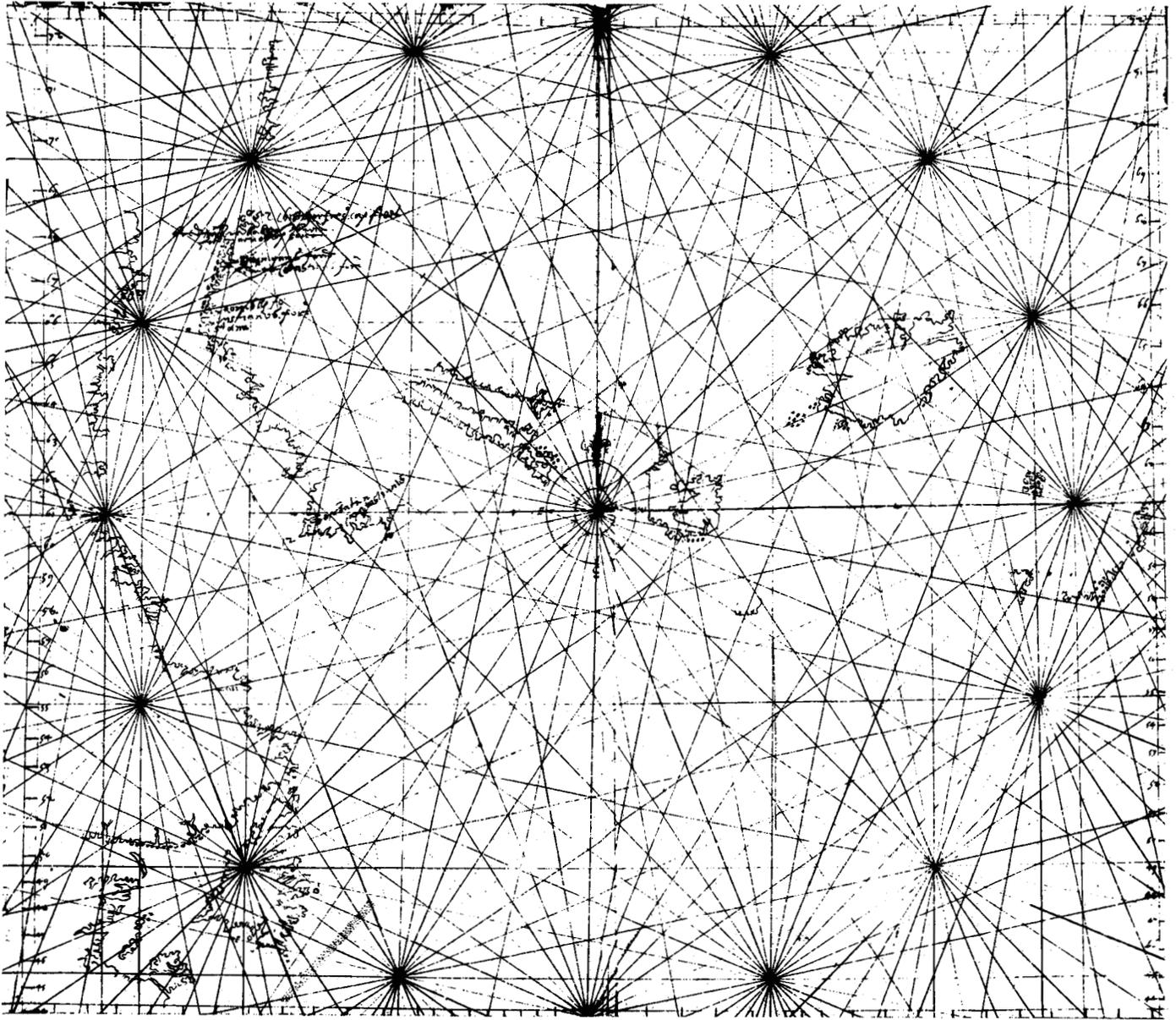


FIG. 3. The "Stockholm chart", 1605-1607; MS in the Royal Library, Stockholm.

lisle, however, only reproduced the corrections that Gripenhielm had made in the southern regions; for the north he kept essentially to Bureus's version.

The practice of taking possession of maps, copying them, and then publishing them under the copyist's name was common at this time. Among others, Philipp Johan von Strahlenberg, the captain of a Swedish vessel, had first-hand experience of this. Imprisoned by the Russians in 1709, he spent 13 years in captivity: from 1711 he was held in Tobolsk, the centre for all information about Siberia. In 1715 the first map he drew of the Russian Empire was spirited away. Three years later when he had finished a new map, it was confiscated by the Russian governor of Tobolsk. However, he had managed to get a copy to another Swedish prisoner of war in Moscow, where a German merchant laid hands on it. In 1726 Strahlenberg learned that his 1718 map had been printed in Amster-

dam, but by this time he could barely recognize his own work, as in the interval he had considerably enlarged his knowledge of Siberian topography. In 1721-22 he had been allowed to join the expedition of the German savant G. Messerschmidt to the Ob' region and beyond to Krasnoyarsk. In 1730, back in Sweden once more, he published his great map of Siberia. Primarily he corrected the topography of the region between Ob' and Lake Baykal, but he also added corrections to the coastlines and the alignment of the mountains in the north and east, as well as to the outline of Kamchatka. Strahlenberg's mapmaking activities were so much appreciated by the Russians that in 1722 they offered him the post of Head of the Survey Office, a newly created section of the Academy of Sciences at St. Petersburg, a post later held by the younger brother of Guillaume Delisle, Joseph Nicholas (Bagrow, 1975:116-120; Novljanskaja, 1966).

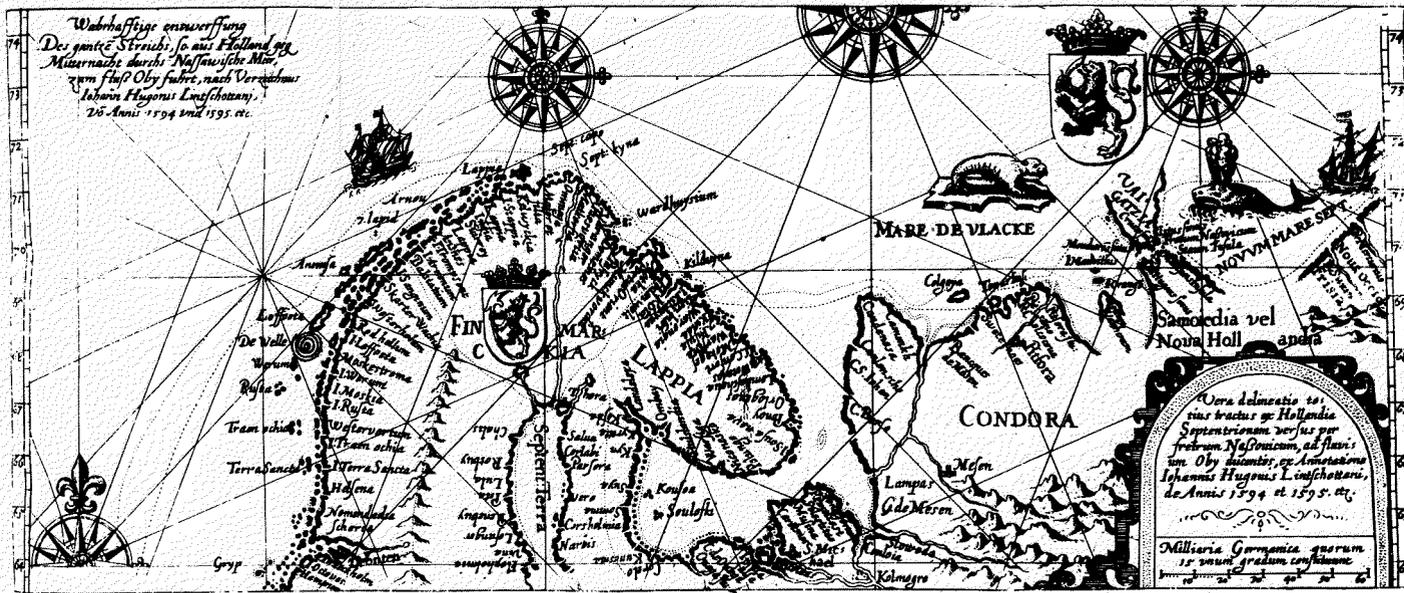


FIG. 4: Nordfjord, Norway, from 1594 (Austrian National Library, Vienna).

Yet other Scandinavians made their careers in the Russian administration. There was, for example, the Norwegian Niels Olsen, originally from Stavanger, who had taken the name Cornelis Cruys during his apprenticeship in the Netherlands. In 1697 he began to map the region of the Don and in 1703 he published an atlas of the river basin which was published in Amsterdam (Bagrow, 1975:98-102). There, he engaged the services of the Danish navigator Vitus Bering, then aged 22, who had just come back from the Indies. It was probably Bering's knowledge of the area which made it worth placing him at the head of an expedition to decide how far Asia extended eastwards. From 1725-1730 Bering and his 33 colleagues, among whom was the Dane Morten Spangberg, explored the Russian Empire to the borders of Kamchatka. Two hand-drawn maps (Fig. 5) of this expedition are preserved in the

Royal Library and two other versions in the Military Archives in Stockholm (Bagrow, 1975:157-163; Björkbom, 1941: 128-132; Efimov, 1964:Pl.65). Swedish interest in Siberia was a centuries-old tradition. The first Russian map of Siberia drawn by Piotr I. Godounov in 1667 was quickly copied by the Swedes Fritz Croneman and Claes J. Prytz, and when Godounov corrected his map in 1672, the first thing the Swedish Ambassador, Eric Palmquist, did was rush to copy it (Bagrow, 1975:26-30).<sup>11</sup>

Two months after his return to St. Petersburg in 1730, Vitus Bering revealed the plans for a new expedition to make a cartographical survey of the whole north coast of Siberia from Ob' to the Lena, the northwest coast of America, the region of Amur, and Japan. During this "Great Northern Expedition" as it was called (1733-1743), Bering entrusted the carto-

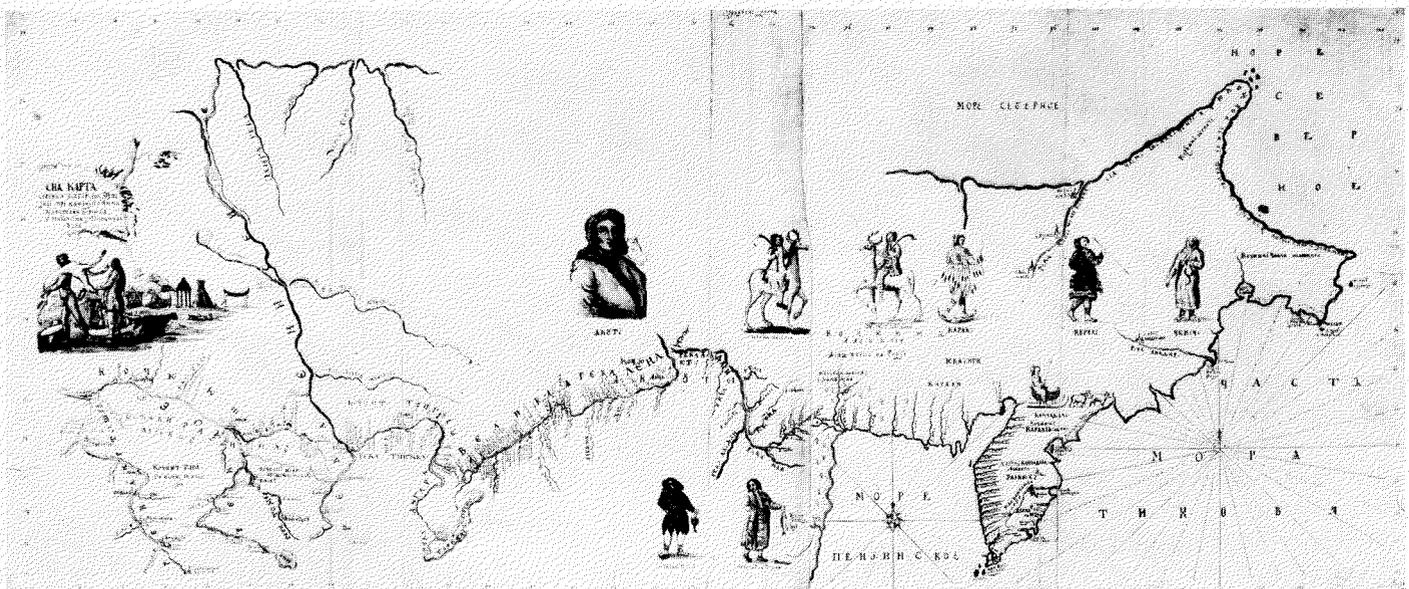


FIG. 5. So-called "Bering map" of 1725-1730 (Royal Library, Stockholm). Another copy of this map is in the Military Archives in Stockholm.

graphical work to several Scandinavians, among whom — apart from Spangberg — were the Dane Peter Lassenius and the Swede Sven Waxell.

Scientific collaboration between Scandinavia and Russia was always excellent, even when their countries were at war. Thanks to this cooperation, particularly with the Russian V.N. Tatišev, Emanuel Swedenborg was able to make a map of the Siberian mines, published in his work “Regnum subterraneum sive minerale de ferro” (1734).

Over a long period the mining industry was the pride of Sweden. Many people came from other European countries to help exploit the mineral veins. One of them was the Dutchman Abraham Momma, ennobled under the name of Reenstierna, who, in 1652, founded an ironworks at Kengis and a copperworks at Svappavaara in the River Torne area of Lapland. (The portrait of him copied by J. Schefferus, which depicts him sitting in a Lapp sledge pulled by a reindeer, has made him the pictorial archetype of a Lapp). The discovery of minerals certainly aroused the interest of the public authorities but not until 1736 were the metalliferous areas mapped systematically. At this time, Tornedalen (the valley of Torne) claimed the attention of the international scientific community for quite another reason: in 1736-37 a French expedition under P.L.M. de Maupertuis made a trip in Lapland to measure the length of a degree of the meridian. For a century the real shape of the Earth had been discussed in Europe, and the measurements made in 1736-37 confirmed that the terrestrial globe is flattened at the poles. Jonas Meldercreutz, a Swede who took part in this expedition, directed the mapping (Fig. 6) of the metalliferous grounds in Lapland, which, however, remained at the hand-drawn stage.<sup>12</sup>

During the eighteenth century the most important cartographic work undertaken in northern Scandinavia resulted from the need to establish the frontier between Norway and Sweden. In July 1738 the work of marking out the boundaries was started from Dalsland — the limit reached by the 1661 demarcation — under engineers chosen together by the two kingdoms and under the guidance of an ad hoc commission. The work was only finished in 1767. During the preliminary investigations, the two sides asked the local populations to which of the two countries they thought they belonged. It so happened in Finnmark that the inhabitants felt they were as much part of Norway as of Sweden. The most tricky differences were on the line of the frontier between Halti and Varangerfjord. For the Swedes, Finnmark had only been mapped by land from the south, and the Norwegians had only been able to take over the coastal regions from the direction of the sea. The mapping of northern Norway by the Norwegians had not got beyond the unsatisfactory hand-drawn stage: Melchior Ramus had tossed off some elementary maps between 1689-1693 and from 1714 on Isaac Olsen had made rudimentary maps of Finnmark and the Kola peninsula. From 1740 onwards, two foresters of German origin, Johan Georg and Frantz Philip von Langen, drew maps of some parts of northern Norway. These were used by the Danish cartographer Christian Jochum Pontoppidan (Nissen, 1938, 1939, 1943, 1957/58, 1963/64),<sup>13</sup> but before he engraved his map of northern Norway (Fig. 7) in 1795 and printed a descriptive com-

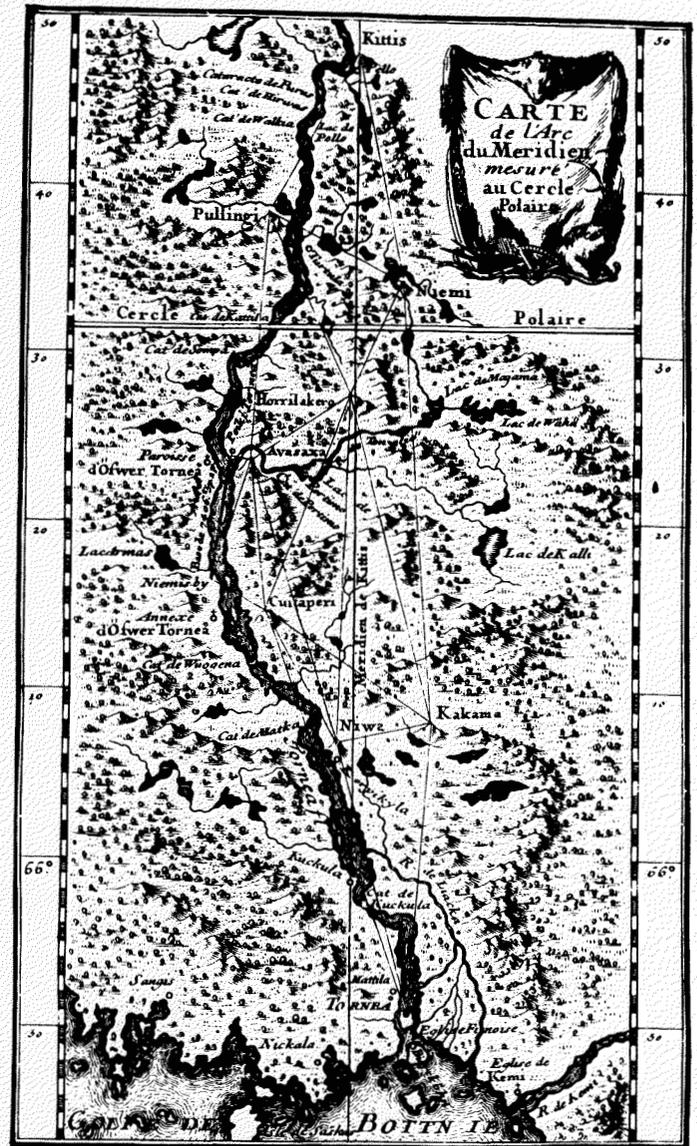


FIG. 6. The valley of Torne, mapped by the French expedition under P.L.M. de Maupertuis in 1736-37.

mentary in Copenhagen, he studied the copious documentation on the Swedish-Norwegian frontier which had been compiled between 1752 and 1766 by professional Danish, Norwegian, and Swedish cartographers.<sup>14</sup> The determination of the frontier meant that Sweden gave up to Norway fairly large stretches of Finnmark, but the Swedes comforted themselves with the thought that an opportunity would one day occur which would enable them to take it back again. Nevertheless, since 1767, the northern border of Finland has always followed the line of the river Tana to the southwest, thereafter going northwest up to Halti. Disputes over the pasturing of Lapp reindeer on one side of the frontier or the other persist to this day.

Nils Marelius, a Swede who had participated in the work of frontier delimitation, also hoped to be able to profit from the material produced by the Commission. He published a description of the frontier region, with some latitudinal observa-

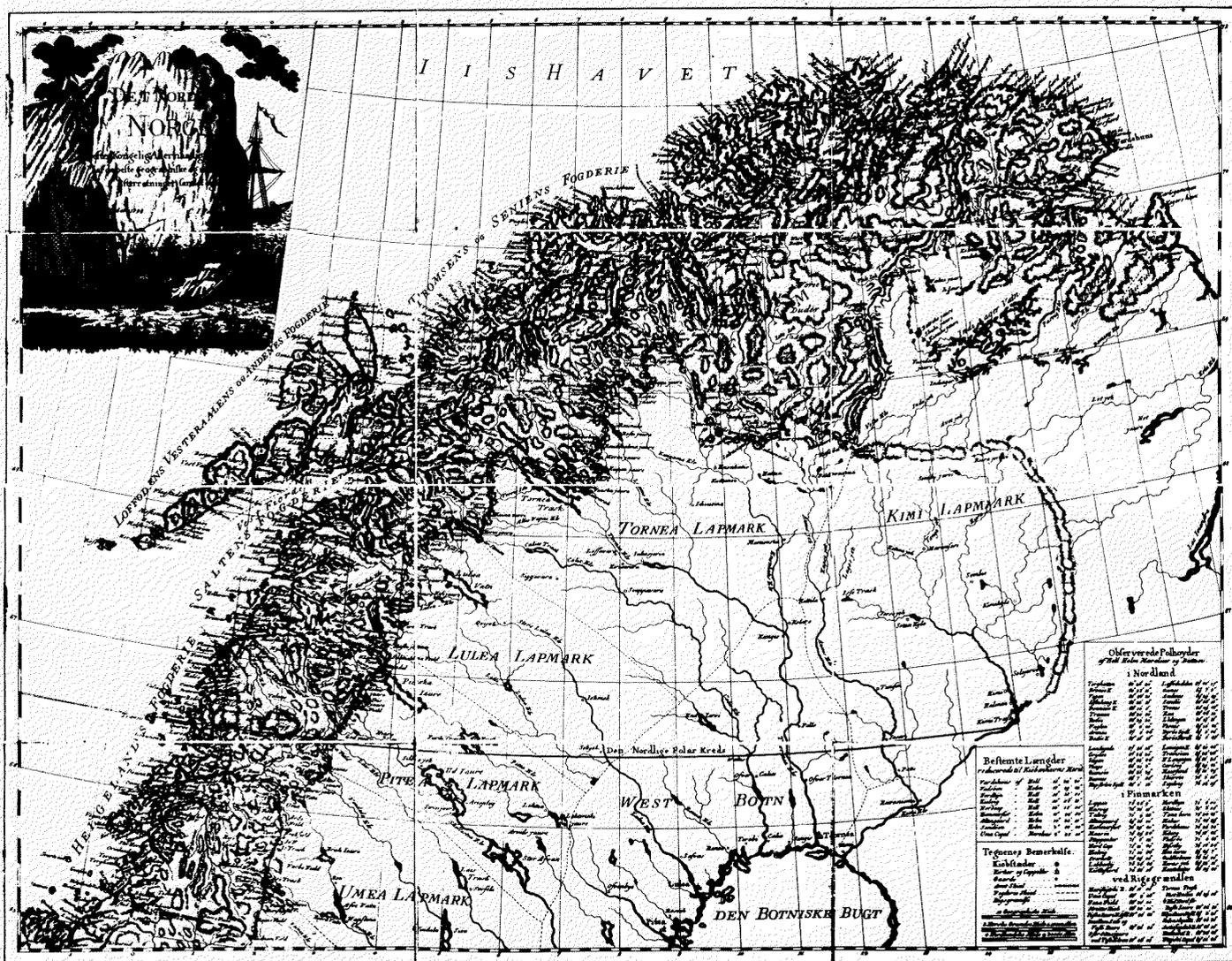


FIG. 7. Pontoppidan map of northern Norway, 1795.

tions, in the papers of the Royal Swedish Academy of Science. However, no Swedish maps of Norway ever existed to compare with those made by Pontoppidan. It was Samuel Gustaf Hermelin, a Counsellor for Mines, who, from 1796 to 1818, published the first atlas of Sweden-Finland in 33 sheets (Lönborg, 1903:167-168, 175ff).

Hermelin had originally intended to make a statistical and economic inventory covering the whole kingdom, complete with maps. Since he had thrown himself into the creation of a lasting iron industry based on the mineral sources of Lappland, it was entirely in his interest to have a map made of the Lapp regions and of western Bothnia. From 1795-1796, Anton Swab, the chief mining engineer, and Clas Wallman, the mining cartographer, made a map of these rich mineral areas which became the first sheet of Hermelin's atlas. This, in turn, was corrected from 1801 onwards by an official of the Mining Council, Carl M. Robsahm, who had been given the task of colonizing northern Bothnia. It was therefore to his advantage that the mining areas of Gällivare and Kiruna were correctly drawn on the map.

Eight years later, in 1809, Sweden lost Finland and a new

frontier had to be created. This time there were no great difficulties because the beds of the rivers Könkämäeno, Muiniojoki, and Torniojoki were quickly accepted as the demarcation line. Since the town of Torneå thus became part of Finnish territory, the Swedes were obliged to found a new town — Haparanda — on the opposite bank of the river Torne.

The work of Pontoppidan and Hermelin laid the basis for official map-making in the region above the Arctic Circle, work which the state was to continue throughout the nineteenth and twentieth centuries, the golden age of Scandinavian cartography when A.E. Nordenskiöld, Roald Amundsen, and Fridtjof Nansen were actively exploring.

#### NOTES

<sup>1</sup>From a paper by Cardinal Marcus of Senigaglia, representative of Christian II to the Roman Curia. Dated 17 June 1514, this document was published in *Grönlands historiske Mindesmaerker*, Copenhagen, 1845, 3:192-193. A plenary indulgence was granted to the "navigantibus ultra mare glaciale ad insulas concedentis".

<sup>2</sup>Winter (1939), reproduced in Cortesão and Da Mota (1960) pl. 43. The editor, Cortesão, stresses that this map should be the subject of more in-depth study.

<sup>3</sup>For example, in the National Archives of Sweden there are three maps that give an idea of the general aspect of these three documents: a political map sketch of the coastal hypsography of the arctic regions and the Kola Peninsula, clearly defining the Swedo-Norwegian fjäll chains (the Kioelen Mountains) and the Finnish summit line; a map of the Kemi River basin and its countless ramifications; and a "voyage map" of the region, extending from the upper part of the Gulf of Bothnia to the northern lands. See Grotenfelt (1892); Sverges traktater (1903).

<sup>4</sup>While official cartography began in Finland as early as 1633, a similar cadastral survey was not begun in Denmark until 1757 and in Norway until 1773. Both Denmark and Norway, however, had already been mapped by civilians as well as by the military, usually under royal order. But their maps were never engraved, having been declared secret documents. Thus the making of maps of the Arctic long remained the privilege of the Swedes.

<sup>5</sup>Preserved in the Danish National Archives in Copenhagen, it bears the critical inscription: "Svenske Landtmeters afriiss, som icke er sonderlig just" (a rather poor drawing by the Swedish geometer).

<sup>6</sup>The hypsographical map of the fjälls done by Tresk is preserved in the National Archives of Stockholm. A more detailed copy of the map of Torne Lappmark can be found in the Military Archives of Sweden in Stockholm, as can three maps (one a copy) of the Kemi Lappmark. (Olof Tresk, *Kartor öfver Kemi & Torne Lappmarker 1642 och 1643*. With an historical introduction by Nils Ahnlund, Stockholm, 1928.)

<sup>7</sup>The map of Jonas Giädda is preserved in the National Archives of Sweden. (See Qvigstad and Wiklund, 1909.)

<sup>8</sup>Wiklund (1897). Schefferus worked from the MS S 164 in the University Library of Uppsala, while Wiklund based his edition of the text on MSS D 65 and 66 of the Royal Library of Stockholm.

<sup>9</sup>Cod. Holm. K29.-Gosch (1897:139-163). In an Appendix to the first part (The Danish Expeditions to Greenland in 1605, 1606, and 1607, to which is added Captain James Hall's Voyage to Greenland in 1612), Gosch puts forward his theories concerning Hall's copy work and the use of Hessel Gerritsz's map.

<sup>10</sup>Gosch (1897:146-184) The second part (The Expedition of Captain Jens Munk to Hudson's Bay in search of a North-West Passage in 1619-20) contains Gosch's comments on the map. A commemorative expedition was launched in 1964 (Hansen and Seeberg, 1965).

<sup>11</sup>Bagrow (1975:26-30). The reproduction drawn by Fritz Croneman in 1669 and the one by Eric Palmquist in 1672 are preserved in the National Archives of Sweden in Stockholm; the one by C.J. Prytz (1669), in the Royal Library of Stockholm; and an anonymous reproduction of the 1672 version, in the University Library of Uppsala.

<sup>12</sup>These maps are preserved in the Military Archives of Sweden in Stockholm and in the collections of the Royal Library accompanying the accounts of the Provincial Governor, Gabriel Gyllengrijp, on Western Bothnia, published in 1736 (Cod. Holm. M 138).

<sup>13</sup>Nissen (1938, 1939, 1943, 1957/58, 1963/64). On the subject of the von Langen brothers, cf. No. 2 (1939), and on the subject of Melchior Ramus cf. No. 3 (1943).

<sup>14</sup>The boundary maps drawn between 1752 and 1766, during the demarcation of the common boundary between Norway, Sweden, and Finland (as well as those of the boundary between Sweden and Finland, established in 1810), preserved in the National Archives of Sweden, have been reproduced by C. Hallendorf as an annex to *Sverges traktater med främmande magter* (Stockholm, 1917). The original maps, drawn between 1752 and 1766 under the supervision of the Boundary Commission, can be found in the Military Archives of Sweden in Stockholm and in the National Archives of Norway and Denmark.

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